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# University Names First Research Scholar

# University of Dayton, Ohio (url: http://www.udayton.edu/index.php)

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**10.19.2009 | Research, Faculty** Research to produce viable, affordable and environmentally friendly jet fuel from coal and biomass is about to get a boost from nationally recognized synthetic-fuels chemist Heinz Robota, who joined the University of Dayton Research Institute Oct. 5 to lead efforts at the Air Force's new Assured Aerospace Fuels Research Facility.

Robota, the University of Dayton's first endowed researcher, comes to the Research Institute through funding from the Ohio Research Scholars Program. He is the first of five scholars to be hired for the program's "Center for Intelligent Propulsion and Advanced Life Management," a collaborative effort among the University of Cincinnati, Ohio State University and the University of Dayton Research Institute. Each school was awarded a grant to hire scholars to accelerate research in advanced power and propulsion.

The mission of the research scholars program complements Air Force-funded research underway at Wright-Patterson Air Force Base, where the Research Institute and Air Force Research Laboratory scientists have been working to create the nation's first federal research test facility dedicated to developing new and improved jet fuels from coal and biomass. Initial research is underway and groundbreaking for a new facility to house expanded research and test equipment is scheduled later this year at the base.

Robota, an expert in synthetic fuels chemistry and catalysis, will play a significant role in ramping up research at the new facility, said Dilip Ballal, head of the Research Institute's Energy and Environmental Engineering division.

"Dr. Robota brings a wealth of experience and demonstrated success in the fuels industry," Ballal said. "We're excited to bring on board a scientist of his caliber to help fulfill the Air Force mission to find an affordable, efficient and greener domestic alternative to foreign petroleum-based fuel."

Robota has more than 30 years experience in fuels, emissions, catalysis and materials technologies, most recently at Range Fuels Inc., an alternative fuels start-up in Broomfield, Colo., and as a director of research at the Syntroleum Corp. in Tulsa, Okla. He holds 13 patents and spent two years as an Alexander von Humboldt Fellow at the University of Munich.

At the Assured Aerospace Fuels Research Facility, Robota will perform research to answer fundamental scientific questions about various aspects of current and future synthetic fuels. He'll work with AFRL and University of Dayton researchers to develop "research quantities" of coal- and biomass-derived jet fuel — as much as 15 gallons per day, Ballal said. That amount will be sufficient to perform a variety of tests to evaluate combustion performance and emissions, in addition to jet fuel properties.

"Our objective is to define the optimal conditions under which jet fuel should be developed in order to maximize the amount of fuel that can be manufactured from coal and biomass," Ballal said. "We will also work to define and recommend methods that fuel manufacturers can use to reduce the carbon footprint of synthetic fuels production to levels below those of petroleum fuels production methods."

Sponsors are also looking to Robota to publicize the aerospace fuels research facility in the scientific and engineering community, principally through conference presentations and research publications.

"The facility will be a national asset, available for use by any industrial or organizational research team in the country," Ballal said. "Researchers will be able to test existing fuel products or develop advanced fuel products by way of catalysts and various feedstock."

By altering the molecular structure of fuel, researchers may one day be able to create jet fuel with fewer additives than the six currently used to improve fuel properties such as lubricity and freeze point.

"It would be wonderful if jet fuel could be created with these properties already built in, especially because future aircraft will have far more powerful and efficient engines operating at much higher temperatures, creating a more stressed environment for

fuel," Ballal said. "In addition, new synthetic fuels would offer us the opportunity to develop ultra-efficient combustors with ultra-low emissions for future jet engines. The Assured Aerospace Fuels Research Facility will facilitate entirely new levels of alternative fuels research in the United States. Thanks to the Ohio Research Scholars Program, we now have the expertise to get it going."

The Ohio Research Scholars Program, jointly funded by the state's Department of Development and Board of Regents, awarded 11 grants to seven universities to support research and commercialization in the areas of advanced materials, biosciences, information technology, power and propulsion, and instruments, controls and electronics.

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